15. Polymers in Wafer Level Packaging

Course Leader: Jeffrey Gotro –InnoCentrix, LLC

Course Description: The course will provide an overview of polymers and the important structure-property-process-performance relationships for polymers used in wafer level packaging. The main learning objectives will be: 1) understand the types of polymers used in wafer level packages, including underfills (pre-applied and wafer applied), mold compounds, and substrate materials 2) gain insights on how polymers are used in Fan Out Wafer Level Packaging, specifically mold compounds and polymer redistribution layers (RDL) 3) learn the key polymer and processes challenges in Fan Out Wafer Level and Fan Out Panel Level Packaging.

Course Outline:

1. Overview of polymers used in Wafer Level Packaging
2. Wafer level process flows (chip first versus chip last (RDL first))
3. Epoxy Mold compounds for eWLP, chemistry, formulation, processing
4. Photosensitive polyimides and polybenzoxazoles for RDL, chemistry and processing
5. Polymer challenges in Fan-out wafer level packaging
6. Wafer versus panel processing; polymer challenges and solutions
7. Reliability testing for Fan-out wafer level packaging
8. Pre-applied underfills and wafer level underfills, chemistry and process
9. High density substrate materials including coreless substrates

Who Should Attend:

Packaging engineers involved in the development, production, and reliability testing of semiconductor packages would benefit from the course. R&D professionals interested in gaining a basic understanding of the structure/property/process/performance relationships in polymers and polymer-based materials used in electronic packaging will also find this course valuable.

BIO**:** Dr. Jeff Gotro has over thirty-eight years' experience in polymers for electronic applications and composites having held scientific and leadership positions at IBM, AlliedSignal, Honeywell, Ablestik Laboratories, and InnoCentrix, LLC. He has published sixty technical papers (including 4 book chapters) in the field of polymeric materials for advanced electronic packaging applications, holds 15 issued US patents, and has 4 patents pending. Jeff is a Fellow of the International Microelectronics Assembly and Packaging Society (IMAPS) and was awarded the IMAPS John A. Wagnon Jr. Technical Achievement Award in 2014 for his numerous technical contributions relating to polymers used in electronic packaging. Jeff was an Adjunct Professor at Syracuse University in the Dept. of Chemical Engineering and Materials Science from 1986-1993. Jeff holds a B.S. in Mechanical Engineering/Materials Science from Marquette University and a Ph.D. in Materials Science from Northwestern University with a specialty in polymer science.